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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,745	07/08/2005	Hiroshi Yamamoto	28955.4028	9824
27890	7590	03/26/2010		
STEP TOE & JOHNSON LLP 1330 CONNECTICUT AVENUE, N.W. WASHINGTON, DC 20036			EXAMINER WILSON, MICHAEL H	
			ART UNIT 1794	PAPER NUMBER
			MAIL DATE 03/26/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/541,745

**Applicant(s)**

YAMAMOTO ET AL.

**Examiner**

MICHAEL WILSON

**Art Unit**

1794

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 6, 9-11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3, 6 and 14-21 is/are allowed.
- 6) ☒ Claim(s) 9-11 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB06)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 20090923

## DETAILED ACTION

### *Response to Amendment*

1. This Office action is in response to Applicant's amendment filed 28 December 2009, which cancels claim 7 and amends claims 9 and 10.

Claims 1-3, 6, 9-11, and 13-21 are pending.

2. The rejection of claims 9 and 10 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is overcome due to applicants amending of the claims in the reply filed 28 December 2009.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

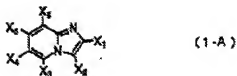
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

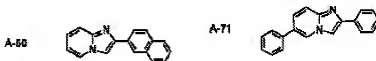
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 9-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatsuka et al. (JP 2001/035664 A), machine translation relied upon, in view of Ise (JP-2002-038141-A), machine translation relied upon.

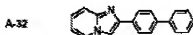
Regarding claims 9-11 and 13, Nakatsuka et al. disclose heterocyclic compounds containing the imidazopyridine structure shown below [0007]. The reference uses the compounds in an organic electroluminescent device and discloses the compounds to be suitable light-emitting material emitting blue light ([0095] and [0106]). Nakatsuka et al. define the substituents on the molecule where X<sub>1</sub> includes substituted or unsubstituted aryl substituents [0007]. The reference explicitly mentions 1- and 2-naphthyl substituents [0014], and aryl substituents of 6-10 carbons are preferred, but are not limited [0020].



Nakatsuka et al. give several examples, including naphthyl substituents (shown below, compound A-50, [0032]); though the reference does not illustrate specifically a naphthyl substituent at X<sub>4</sub>, but do give examples of aryl substitution at position X<sub>4</sub>, as shown below (compound A-71, [0037]).

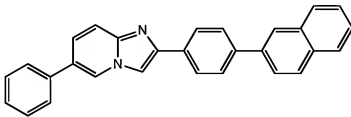


Nakatsuka et al. give also illustrate a phenyl bound via a linking phenyl group (biphenyl), shown below (Compound A-32, [0029]).



Ise teaches similar heterocyclic compounds for use in electroluminescent devices (abstract). The reference teaches compounds with a similar heterocyclic core (benzimidazole) which display blue luminescence [0007]. The reference teaches these compounds to have condensed aryl groups bound to the heterocyclic core via a phenyl linking group ([0051] and [0052]). These compounds are also taught to improve the stability of the device [0007].

Absent a showing of unexpected results commensurate with the scope of the claims, it would be obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Ise with the compounds of Nakatsuka et al. One of ordinary skill in the art would reasonably expect that combining the teachings of Ise with the compounds of Nakatsuka et al. such as compound A-71 resulting in a compound as the one shown below



would expect similar properties suitable for the same purpose because the compounds in both references are taught to display similar properties (i.e. blue emission). The core heterocyclic compounds in each reference are similar with a similar  $\pi$ -electron system

and skeletal structure only differing by a single nitrogen shifted by one position.

Compounds with larger  $\pi$ -electron systems are within the scope of Nakatsuka et al.

although not specifically exemplified. One of ordinary skill in the art would be motivated by a desire to improve the stability of the device as taught by Ise.

The examiner notes that these are conjugated systems and they have overlapping  $\pi$  orbitals. One of ordinary skill in the art would expect a compound with a larger  $\pi$ -electron system to have a larger delocalized  $\pi$ -cloud and thus be more stable because charge would be more delocalized and spread out.

***Allowable Subject Matter***

6. Claims 1-3, 6, and 14-21 are allowed.
7. The following is a statement of reasons for the indication of allowable subject matter:

Claims 1-3, 6, and 14-21 remain allowable for the reasons of record (Office Action mailed 16 September 2009). The closest prior art, Kim et al. (US 6,998,487 B2) Hosokawa et al. (2002/0048687 A1), do not teach or suggest the heterocyclic compounds or organic electroluminescent device as presently claimed. Kim et al. (US 6,998,487 B2), teaches compounds wherein  $Ar^2$  is an aryl group with 6-60 carbons however the reference does not teach or suggest the specific groups for  $Ar^2$  as claimed. Hosokawa et al. (2002/0048687 A1) teach heterocyclic compounds but does not teach or suggest compounds with the specific combinations of L,  $Ar^1$ , and  $Ar^2$  of the present claims.

***Response to Arguments***

8. Applicant's arguments, see Remarks, filed 28 December 2009, with respect to the rejection(s) of claim(s) 9-11 and 13 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Nakatsuka et al. (JP 2001/035664 A) in view of Ise (JP-2002-038141-A).

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 1794

MHW